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MINERAL INDUSTRY SURVEYS

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TIN IN DECEMBER 1996

Domestic consumption of primary tin in December was estimated by the U.S. Geological Survey (USGS) to be about 6% lower than in November 1996 and slightly lower than in December 1995.

The *Platt's Metals Week* composite price for tin was $3.95 per pound; slightly lower than in November and 6% lower than in December 1995.

In Portland, OR, it was announced that Schnitzer Steel Industries Corp. had successfully completed the acquisition of Houston-based scrap processor Proler International Corp. after a prolonged contest with Hugo Neu Corp. for control. Proler is a major domestic detinner, with detinning plants in Coolidge, AZ, and Seattle, WA.[1]

In Llanelli, United Kingdom (UK), AMG Resources Corp. Ltd. reported on developments in its detinning operations. This British operation is a unit of the American parent company of the same name. AMG reported that local government initiatives and roadside collection programs have resulted in an increasing number of used tin cans finding their way into the recycling chain. AMG officials project that the Llanelli detinning plant will treat about 25% more used tin cans in 1996 than in 1995. In 1995 this plant produced 80,000 tons of scrap steel from detinning new tinplate scrap and 20,000 tons from detinning used tin cans. AMG also operates a detinning plant in Hartlepool, UK. AMG reported that limited amounts of tin are recycled from tinplate at both plants, and at Llanelli about 150 tons of tin are produced each year from used beverage cans. This tin generally takes the form of 99.99%-pure tin ingots. AMG's tin ingot is listed on the London Metal Exchange as "RBW," but the bulk of the material is sold directly to British tin alloy, copper wire, or solder operations. AMG officials are optimistic about the future of its UK detinning operations, but they doubt if the detinning business will reach the levels achieved before aluminum beverage cans began to eat into tinplate's market share during the 1970's. Despite this, business has increased since the early 1990's when used tin can recycling programs began to accelerate.[2]

In London, UK, it was observed that proposed government regulations controlling the recycling and recovery of packaging waste in the UK were due to come before Parliament by yearend 1996, despite disputes over details of how this should be effected. Valpak, the organization being set up to coordinate recycling and recovery operations in the UK, was urging firms to join now. A discounted membership fee was being offered for those who sign up early. The fee reportedly will be based on a one-time membership fee related to company sales, and from 1998 on, material-specific levies. The material-specific levies will be paid yearly and will be published when all members' data have been received. Currently, about 106 companies have joined Valpak, but the organization expects eventual membership to run into the thousands. All firms handling in excess of 50 tons annually of packaging materials are required to recover half of that by 2001.[3]

In Copenhagen, Denmark, it was reported that the Danish Government is coming under increasing pressure to conform to the European Union's (EU) Packaging and Waste Directive of December 1994 and lift its "can ban," a prohibition which extends to all "one way" packaging for beer and soft drinks. The European Packaging Steel Producers Group (known by its French acronym APEAL) indicated that if Denmark is allowed to evade the EU's directive it could start a domino effect, with other EU countries adopting similar measures. This could significantly affect the EU's metal can industry and its suppliers. While Denmark is the only EU member with an outright ban on metal cans, Greece, Portugal, Luxembourg, Sweden, Finland, and Germany are considering measures such as eco-taxes and quotas calling for a certain percentage of beverage containers, to be refillable containers. Quotas on refillable containers, such as the 72% one being proposed on beer sales in Germany, would necessitate that a certain

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proportion of sales be made in refillable containers. APEAL officials claimed that its eight members, who represent 96% of European tinplate production, were not unduly concerned about the comparatively small Danish market; but that it is the principle that matters. The Danish "can ban" has been in force since 1975. In 1986, the European Court of Justice said it was a trade barrier, but in the absence of common rules the Court could not act. However, after the passage of the 1994 EU packaging directive, Denmark was required to comply with the directive by June 1996.[4]

From Lima, Peru, reports indicated that Minsur's new $24 million tin smelter began production in September and is poised to produce tin metal at less than half the industry's average cost. The smelter has a capacity of 15,000 tons per year of refined tin. There were some initial concerns in the industry over the viability of the Ausmelt technology utilized in the smelter; but now refined tin production has reached the 2,400-ton-per-year level, although some start-up problems still are being encountered. Reportedly, commercial shipments of Grade A tin have begun, and the company expects to eventually gain LME certification for its tin brand. Minsur hoped that 1997 output would approach the full refined production capacity of 15,000 tons per year. Minsur projected that subsequent years could well see capacity reach 20,000 tons per year when oxygen enrichment equipment is installed. Once it reached near capacity, the new smelter was expected to smelt and refine tin concentrates at a cost of $300 per ton or less. This would be half of the $600-per-ton cost that Minsur encountered in having 12,000 tons of its own concentrate toll refined this year at Vinto's tin smelter in Bolivia. The industry average smelting and refining cost is reported to be about $700-$800 per ton of metal. Minsur officials expected that its total depreciation plus mine - through - refinery costs, already the world's lowest at $1,850 per ton, could decline to $1,180 per ton in 1998; this contrasts to an industry average of $2,500-$3,000 per ton. With the start-up of its own smelting operation, Minsur was now in a position to reduce its tolling contracts. All of Minsur's mine output of 22,000 tons in 1995 was toll refined at smelters in Asia and South America.[5]

In the UK, it was announced that following extensive diamond drilling, as part of a $7 million capital improvement program in 1995, South Crofty, the UK's only operating tin mine, increased its demonstrated ore reserves from 670,000 tons in early 1995 to 830,000 tons in early 1996; average grade 1.54% tin. The mine's management expected that ore throughput will be about 185,000 tons in 1996 and approach 200,000 tons in 1997, with production of tin metal increasing from 2,200 tons to 2,400 tons. The program revealed three new ore lodes which were expected to be brought into production by early 1997.[6]

In São Paulo, Brazil, it was observed that the recent merger of the country's largest tin producer, Paranapanema, with three other major Brazilian nonferrous metals firms was having an impact on the large Pitinga Mine in Amazonas State. The past 6 months have seen several new senior managerial appointments, new development work, as well as rationalization to reduce costs. Tin production levels at the mine are recovering, with output of 11,500 tons in 1996, some 15% higher than in 1995; this, however, is well below the peak annual production levels in the late 1980's of nearly 20,000 tons. Cost reductions have played a major role in Pitinga's recovery. The work force has been reduced from 1,200 to 1,000. Pitinga estimated its cash cost of tin mining at about $1.80 per pound of contained tin—among the world's lowest. Paranapanema believes the next 5 years will see a marked change in the nature of mining at Pitinga as it moves from alluvial to hard rock mining. Officials forecast that the 5-year change-over in mining methodology may cost $100 to $150 million and provide an annual output of 18,000 tons per year of tin-in-concentrate by 1999 at the earliest.[7]

In Wheeling, WV, Ohio Coatings Co. began the first trial runs on its new tinplate line, the first tinplating facility built in the United States in more than 30 years. Production runs were expected to start in late December. Management felt the line would reach about 80% of its eventual 230,000-ton-per-year capacity during 1997. The Ohio Coatings Co. project is a joint venture of Wheeling-Pittsburgh Steel Corp., Dongyang Tinplate Corp. (Republic of Korea), and Nittetsu Shoji America Inc. It was expected that Wheeling-Pittsburgh would supply 75-80% of the light gauge cold rolled coil feedstock.[8]

A recent article highlighted the tin can and its recyclable aspects, domestically:

- The tin can for food was invented in England in the early 1800's.
- The tin can for beer was first produced in 1938.
  The bi-metal tin can (aluminum top on a tinplate body) is now 40% lighter than it was in 1970.
- The tin coating on a steel can has been reduced from pre-World War II levels of 50 pounds per ton of tinplate to a current average of 6 pounds per ton.
- Tin cans do not compost; however, they are biodegradable in the sense that steel cans left exposed to the elements will slowly rust.
- Tin cans are noncombustible; waste-to-energy facilities will normally use magnets to remove tin cans from incineration; tin cans remain inert in modern landfills.
- A 1993 Waste Recyclers Council processing cost study showed an average materials recovery facility processing cost of $67.53 per ton for tin cans, with a range of $30.22 to $125.64. Collection costs could be $217 to $309 per ton. Tin can scrap prices are moderate compared with those of other recyclables and are marked by good stability.
- Used tin can markets are: integrated steel mills 30%, electric arc mills 18%, detinners 13%, exports 9%, iron foundries 2%, other 28%.
- Steel mills are the largest market for used tin cans. Integrated steel mills use the basic oxygen furnace to manufacture steel for tinplate, appliances, and car bodies.

Electric arc furnaces use 100% scrap as a raw material to produce steel shapes such as railroad ties and concrete re-inforcing bar.

- The basic oxygen furnace process now uses about 28% scrap steel to make tinplate and other steel products. Used tin cans provide up to 36% of this scrap requirement.
- Used tin cans account for 2.9 million tons annually or 1.4% by weight of municipal solid waste (MSW).
- Used tin cans discarded in MSW are equivalent to 22.3 pounds per person annually.
- 33 billion tin cans, or 128 per person, were used in 1994.
- The average tin can weighs 2.8 ounces.
- 1.5 million tons of tin cans are recycled annually for a 52% recycling rate.
- 1.4 million tons annually or 0.68% of MSW by weight of used tin cans are landfilled.
- Used tin cans account for 5.2 million cubic yards annually or 1.2% of landfilled MSW.
- Landfilled used tin cans weigh 560 pounds per cubic yard; whole, unflattened used tin cans have a density of 150 pounds per cubic yard; baled used tin cans have a density of 850 pounds per cubic yard.[9]

Update

On February 21, 1997, the *Platt's Metals Week* composite price for tin was $4.01 per pound.

[1]Metal Bulletin. Schnitzer Wins Battle For Proler. No. 8135, Dec. 5, 1996, p. 15.
[2]———. Used Beverage Cans Boost AMG's Detinning Operations. No. 8134, Dec. 2, 1996, p. 12.
[3]———. UK Packaging Recyling Regulations Due Next Month. No. 8130, Nov. 18, 1996, 0. 23.
[4]———. Tinplate Makers Attack Danish Can Ban. No. 8136, Dec. 9, 1996, p. 15.
[5]CRU Tin Monitor. New Minsur Tin Smelter To Halve Costs. Dec. 1996.
[6]———. Other Mine Developments. Dec. 1996.
[7]———. Other Mine Developments. Dec. 1996.
[8]———. Tinplate News. December 1996.
[9]Waste Age. Waste Product Profile: Steel Cans. V. 27, No. 7, July 1996, pp. 121-122.

Publications on the Internet

Monthly, quarterly, and annual Minerals Information publications are now available through the World Wide Web (www). These publications include Mineral Commodity Summaries, Minerals Yearbook, Mineral Industry Surveys, and Metal Industry Indicators. To access Minerals Information publications, visit the Minerals Information home page at http://minerals.er.usgs.gov/minerals.

TABLE 1
SALIENT TIN STATISTICS 1/

(Metric tons, unless otherwise noted)

		1996		
	1995	November	December	January-December
Production, secondary e/ 2/	11,100 r/	900	900	10,800
Consumption:				
Primary	35,100 r/	3,080 r/	2,890	36,200
Secondary	10,700 r/	828	829	10,300
Imports for consumption, metal	33,200	2,000	NA	NA
Exports, metal	2,790	560	NA	NA
Stocks at end of period	11,400 r/	7,090 r/	4,660	XX
Prices (average cents per pound): 3/				
Metals Week composite 4/	415.61	401.00	394.76	XX
Metals Week New York dealer	294.54	279.14	272.06	XX
London, standard grade, cash	282.00	271.00	265.00	XX
Kuala Lumpur	277.50 r/	267.00	263.82	XX

e/ Estimated. r/ Revised. NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits, except prices.

2/ Comprises tin recovered from alloys and tinplate. The detinning of tinplate (coated steel) yields only a small part of the total.

3/ From Platt's Metals Week.

4/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed charges, finance charges, and a risk factor. It normally is substantially higher than other tin prices.

TABLE 2
METALS WEEK COMPOSITE PRICE

(Cents per pound)

Period	High	Low	Average 1/
1995 (annual)	473.30	360.15	415.61
1995:			
December	427.10	416.42	419.75
1996:			
January	423.56	415.24	418.59
February	417.70	411.89	415.55
March	427.03	405.03	414.71
April	435.05	422.96	429.61
May	436.25	415.30	426.88
June	418.01	410.83	413.65
July	423.04	408.27	417.03
August	411.84	407.75	409.11
September	413.10	402.69	408.04
October	404.38	396.12	400.25
November	409.57	392.40	401.00
December	405.37	388.49	394.76

1/ The Metals Week composite price is a calculated formula, not a market price, that includes fixed charges, finance charges, and a risk factor. It normally is substantially higher than other tin prices.

Source: Platt's Metals Week.

TABLE 3
TINPLATE PRODUCTION AND SHIPMENTS IN THE UNITED STATES 1/

(Metric tons, unless otherwise noted)

Period	Tinplate waste (waste, strips, cobbles, etc.) (gross weight)	Tinplate (all forms)			
		Gross weight	Tin content	Tin per metric ton of plate (kilograms)	Shipments 2/
1995 r/:	206,000	1,640,000	9,670	5.9	2,640,000
1996:					
January	14,200	116,000	729	6.3	179,000
February	16,700	131,000	826	6.3	196,000
March	16,900	144,000	813	5.6	220,000
April	16,100	124,000	790	6.3	202,000
May	16,200	122,000	821	6.7	208,000
June	16,500	137,000	843	6.2	218,000
July	15,700	141,000	857	6.1	231,000
August	14,600	132,000	845	6.4	237,000
September	14,200	133,000	809	6.1	212,000
October	13,000	127,000	793	6.2	213,000
November	14,300	130,000	827	6.3	207,000
December	12,700	114,000	664	5.8	NA

r/ Revised. NA Not available.

1/ Data are rounded to three significant digits.

2/ Shipments data from American Iron and Steel Institute monthly publication AIS10.

TABLE 4
U.S. TIN IMPORTS FOR CONSUMPTION AND EXPORTS 1/

(Metric tons)

Country or product	1995	1996		
		October	November	January-November
Imports:				
Metal (unwrought tin):				
Bolivia	6,630	515	353	5,780
Brazil	8,070	700	660	8,260
China	5,610	89	129	2,560
India	146	203	80	819
Indonesia	7,230	817	520	6,880
Malaysia	3,810	20	10	965
Russia	149	--	--	435
Other	1,510	115	249	1,300
Total	33,200	2,460	2,000	27,000
Other, (gross weight):				
Alloys	11,400	1,120	711	10,500
Bars and rods	484	29	95	639
Foil, tubes, and pipes	16	--	(2/)	(2/)
Plates, sheets, and strip	468	1	6	638
Powders and flakes	37	--	--	--
Waste and scrap	15,900	209	29	6,490
Miscellaneous	1,470	154	183	1,230
Total	29,800	1,510	1,020	19,500
Exports (metal)	2,790	356	560	4,290

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5
CONSUMPTION OF TIN IN THE UNITED STATES, BY FINISHED PRODUCT 1/

(Metric tons of contained tin)

		1996						
		November			December			January-December
Product	1995	Primary	Secondary	Total	Primary	Secondary	Total	total
Alloys (miscellaneous) 2/	W	36 r/	W	36 r/	28	W	28	96
Babbitt	871 r/	20	W	20	23	W	23	245
Bar tin and anodes	1,200 r/	W	--	W	8	--	8	78
Bronze and brass	2,830 r/	71	90	161	41	103	144	1,860
Chemicals	7,060	496 r/	--	496 r/	496	--	496	1,270
Collapsible tubes and foil	W	W	--	W	25	W	25	25
Solder	17,500 r/	498	219	717	501	W	501	8,720
Tinning	1,120 r/	133	--	133	139	--	139	1,650
Tinplate 3/	9,670 r/	827	W	827	664	W	664	9,620
Tin powder	W	W	W	W	W	--	W	291
White metal 4/	965	W	W	W	W	--	W	8
Other	4,560 r/	97	19	116	65	236	301	5,860
Total reported	45,800 r/	2,180 r/	328	2,510 r/	1,990	339	2,330	29,700
Estimated undistributed consumption 5/	--	900	500	1,400	900	500	1,400	16,800
Total	45,800 r/	3,080 r/	828	3,910 r/	2,890	839	3,730	46,500

r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes terne metal.

3/ Includes secondary pig tin and tin acquired in chemicals.

4/ Includes pewter, britannia metal, and jewelers' metal.

5/ Estimated consumption of plants reporting on an annual basis.

TABLE 6
DEFENSE LOGISTICS AGENCY
TIN STOCKPILE DISPOSALS 1/

(Metric tons)

Period	Monthly disposals 2/
1995:	
December	15
Year total	955
1996:	
January	90
February	450
March	534
April	5
May	10
June	330
July	1,180
August	1,370
September	2,300
October	--
November	210
December	200
Total	6,670

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ These disposals represent only the daily, spot sales program. They do not include the long-term dealer contract sales program.

Source: Defense Logistics Agency.